FutureNow *Networks*

Enabling critical use cases for Universities

BLOCK

Executive summary

Networks are an important piece of infrastructure for UK universities. In their most basic form, a network is a group of technologies that share resources and information. And in higher education, this shareability enables universities to deliver a cohesive learning experience and keep research moving forward.

No matter how complex your network is, connectivity will always be fundamental. If technologies can't share, there is no network. And without a network, universities won't be able to provide services that meet modern day expectations or keep innovating like they are today.

However, it can be difficult for those outside digital teams to see the value networks deliver, beyond providing reliable internet connection. This whitepaper aims to make some of those use cases clearer, setting out a vision for what your campus could look like following a network refresh that reflects your university's world-class reputation.

Throughout this whitepaper, you'll see how a strong network touches every corner of university life: from improving access to lectures via virtual learning and protecting research from cyber attacks, to enabling multi-device environments in halls and hosting wayfinding applications for better on-campus navigation. There truly are use cases for everyone.

Taking a step back, network use cases fall into two buckets: those that resolve today's pain points and those that enhance university education further. How you view them will depend on your current set up, but either way there's huge potential here.

A network refresh can tackle urgent issues like reducing outages, boosting cyber security, and delivering a digital experience aligned with student expectations.

It can also lay the groundwork for future areas of development. This includes enhancing remote learning and interoperability between campuses, easily adding cutting edge research tools, and introducing smart technologies that enhance student welfare, lower costs, reduce emissions, and create a better experience.

While you may be tempted to bolt-on new applications now, doing so without the right network can make existing issues worse. Being successful starts with designing a network that's built for your university's needs today and in the future.

What does network infrastructure do for higher education?

The UK education sector has a prestigious reputation, especially when it comes to research quality. However, higher education has taken a hit in recent years. Enrolment rates are dropping, international competition is growing, and more students are struggling to justify the rising cost of degrees.

There's an ongoing conversation here about how digitising higher education can help usher some of those prospective students into the university system.

Right now, many universities' digital transformations are held back by tangled, outdated networks, which are difficult to manage and vulnerable to cyber threats. This creates barriers to the high-speed connectivity students now expect as standard. It also prevents universities from delivering the modern digital services that underpin everything from smart campus operations and energy efficiency to hybrid learning and enhanced student support.

So, what happens when universities do refresh their network infrastructure? What's possible when you achieve fast and future-focused connectivity? And how does it help universities overcome current challenges? These are questions we answer in this whitepaper.

What makes Block qualified to talk about this?

We've been working alongside public-facing organisations for the past 20 years, including Russell Group universities and the NHS. This means we understand the real challenges digital teams face, as well as the wins that come from getting network infrastructure right.

For example, Queen Mary University of London completed a network refresh across 65 buildings with Block in 2024. Now, troubleshooting is twice as fast, complaints to the help desk have reduced, and thousands of devices connect to the network from halls, labs, and high-density lecture theatres.

Our work involving NHS infrastructure played a major role in this collaboration with Queen Mary because healthcare and education face surprisingly similar challenges when it comes to securely managing critical services at scale. This experience gives us specialised expertise, especially when it comes to universities looking to build advanced facilities in medical and science schools.

Now looking ahead, Block's focus is on helping UK universities upgrade their existing sites to optimise the education experience. We'll also be working to implement smart campuses, where network infrastructure is essential to building this intelligence sustainably.

- ISO-accredited (9001, 20000-1, 27001, 14001)

Contents

Block's network architecture enables universities to lean into stronger Wi-Fi connectivity to support competitive applications across higher education. Use cases include:

- Connecting multiple devices across libraries and lecture rooms 8
- Delivering a home-from-home halls experience 10
- Enhancing access to digital resources and supporting world-leading research 11
- Reducing complexity in university infrastructure 12
- Ousting cyber attackers and protecting intellectual property 13
- Decreasing network outages for essential operations 16
- Adding future academic technologies without stress 18
- Improving student safety around campus 19
- Supporting remote working and better inclusivity 20
- Providing real-world, clinical-grade connectivity to medical schools 21
- FutureNow Networks 22

"Our staff and students require access to modern, efficient, and reliable platforms to maximise the value of their teaching, learning, and research activities. It was part of the previous Student President's manifesto to improve Wi-Fi across the campus. We listened. We heard. And we made the change."

Melissa-Jane Olivier, IT Programme Manager at Queen Mary University of London

Connecting multiple devices across libraries and lecture rooms

Access learning and teaching tools any time, anywhere. You can ensure strong, reliable connectivity from every corner of your campus by layering Wi-Fi coverage from multiple access points across your buildings.

So, what does this look like in action, especially in high-density academic environments like lecture halls and libraries?

University libraries often face connectivity challenges, particularly in silent study rooms tucked away in quieter areas of the building, such as the basement.

Ensuring reliable network connectivity in these spaces supports students using digital notetaking apps, online resources, and occupancy monitoring platforms for booking private study areas.

It also makes checking out books and laptops (using RFID tags or barcode scanning) easier as well as sending documents to wireless printers effortless. All of these use cases work to improve the student education experience.

The benefits of strong network connectivity can also be found in lecture halls. A robust network allows hundreds of students to connect multiple devices to Wi-Fi without buffering.

This gives your university the best chance of delivering world-class lectures, without tripping up on basic internet issues.

Students attending classes can seamlessly use tools like transcription software, translators, and cloud-based notebooks to absorb information in whatever way works best for them.

Meanwhile, professors can easily stream lectures for students who can't attend in-person, or who would benefit from rewatching the lecture on-demand - an advantage that boosts inclusive teaching practices.

Reliable network connectivity also enhances back-end operations. For example, the student record system informs multiple university systems including academic transcripts, printing credits, security and building access, network authentication, on-campus postal services, café credits, and even bursaries and fee tracking.

Ensuring every department system can easily connect to the student record system from anywhere on campus means no delays or miscommunication – just a smooth service.

Delivering a home-from-home halls of residence experience

Enable students to easily connect all their devices as well as stay in touch with friends and family. Installing multiple network access points across halls of residence provides reliable Wi-Fi in every bedroom, kitchen, and communal space. This brings more than just academic advantages – it improves day-to-day student life.

Students often move into halls with multiple Wi-Fi-dependent devices, including smart TVs, smart speakers, and games consoles. A strong network lets them use everything at once, without buffering - regardless of whether that's streaming the latest Netflix series, listening to Spotify at predrinks, or gaming online with friends from home.

Here, connectivity also plays a crucial role in pastoral care, especially when many students are living away from home for the first time. A stable connection helps them stay in touch with loved ones and access online mental health services or virtual therapies offered by your university.

This network support also extends to keeping students physically safe. Many security systems rely on connectivity. For example, access to halls can be restricted to specific ID cards, helping prevent unauthorised entry. Meanwhile, security cameras installed in communal areas can capture any incidents and provide peace of mind to the students living there.

Network-dependent security is also a big focus for smart campus development. Embedding the right network infrastructure now, means your university can easily integrate future safety features in halls as they come to market.

Enhancing access to digital resources and supporting world-leading research

Ensure you have the connectivity to support learning management systems (LMS) and digital resources vital to coursework and exam prep.

A network refresh or stabilisation project should be a top priority as your campus continues to digitise. This need isn't going away any time soon, especially as students expect teaching to embrace any technology relevant to their degree.

Plus, with tuition fees at an all-time high, simple digital issues (like slow connections and poor access to online material) just won't be tolerated by students footing the bill.

Your university's network must be ready to seamlessly support tech at every stage of the learning journey.

For example, a student connected to a reliable network can start the day by joining an online lecture with high quality video and audio. They can then access the learning management system to submit an assignment, before viewing digital academic journals to start research on a new project. They can then add their notes to a group project via a shared live document hosted in the cloud. If their research project requires genomic sequencing or climate modelling, they'll also be able to transfer large datasets between devices quickly and securely.

The point is, they can do all these digital tasks without repeatedly logging into the network, waiting on long downloads, or dealing with buffering. It creates a frustration-free learning experience, which frees up time otherwise spent troubleshooting or contacting the help desk.

Seamless access to digital academic journals is also key to levelling the playing field between students across the UK, especially for those studying at newer institutions.

For example, the University of Cambridge's prestigious and restricted Parker Library holds hundreds of unique, centuries-old manuscripts that are core texts for literature and history degrees across the UK. These manuscripts have been digitally scanned by the library to increase access for those outside of Cambridge, but students will still need reliable connectivity from your university to view them.

Once basic digital operations are perfected, your digital team can focus on introducing the innovations that students now expect from their degrees. For example, interactive simulations, augmented reality, and virtual reality. These simulations can potentially enhance learning by providing engineering students with safe, real-world training or giving history students a realistic glimpse into what a past era really looked like.

These are just some of the many advantages digital learning can bring, when underpinned by a high-speed network.

Reducing complexity in your university infrastructure

Decrease the problems your digital team has to deal with by implementing the right network architecture. You're not alone if your university's juggling hundreds of different systems and apps. Connecting them all can be a headache for digital teams, but it's essential for delivering a standout higher education experience.

These multi-system setups, which are often tangled up with legacy tech, need a two-step approach.

Firstly, eliminate manual and time-consuming tasks related to connecting systems by using automation. This way your digital teams won't need to write endless lines of bespoke code or spend hours wandering campus configuring hardware for every new app.

Secondly, consolidate your networks, including public Wi-Fi, so they're no longer siloed. This translates to you needing to buy less equipment, decreasing the hardware you need to maintain, and creating less equipment for you to upgrade in the future. The bottom line is: there's potential to save costs and time.

However, a consolidated network doesn't mean a compromised one. While these networks are physically one, they're logically segmented, which means you're not stacking up technical debt or increasing cyber security risk.

Simplifying your network and automating daily 'fire-fighting tasks' provides more headspace for digital teams to focus on what's next: moving your campus towards smarter, more connected operations. This may include auto-monitoring room occupancy, intelligently adjusting heating, ventilation, and air conditioning (HVAC) and lighting for comfort, and using wayfinding apps to track equipment and navigate campus.

Ousting cyber attackers and protecting intellectual property

Keep your university safe even as you increasingly digitise campus. Last year, MI5 warned UK universities of growing cyber threats from foreign states. These threats are comprehensive attempts to steal cutting-edge research, undermine British national security, and strengthen foreign militaries and economies. The attacks take various forms but exploit vulnerabilities created from technical debt in your network. The consequences here can be costly, disruptive, and damaging to your reputation - and it's becoming a common scenario.

For example, The University of Wolverhampton experienced a 'serious cyber incident' in February 2024 which cut off Wi-Fi and online access for students on campus - pausing lectures.

Just months later, hackers targeted the University of Cambridge's medical IT system, freezing researchers out of critical systems. This incident came shortly after both Cambridge and the University of Manchester were targeted by hacktivists protesting the UK's political stance on Israel and Palestine.

The impact is huge when attacks hit. Students may have to leave campus to get online, lectures are cancelled, and digital teams often work late nights (and cancel holidays) to patch up the network. Not to mention the large fines incurred from a data breach.

Network security needs to be a consideration during your university's digital transformation. Student data is increasingly stored on cloud and more research tools are heading online, which brings big efficiencies. However, it's vital you follow cyber security best practice, and a segmented network can be a part of this plan. The NCSC Cyber Assessment Framework (CAF) encourage this approach, especially among universities holding sensitive research.

So, what does network segmentation actually mean? In short, your network is sectioned, with different systems ring-fenced. Should the worst happen, and you're hit with a cyber attacks your network will go into lock down but you won't need to wait until everything has been patched.

Instead, you can prioritise bringing critical systems, like remote learning, back online first, before moving onto less important sections. That means students stay connected and teaching stays on track.

However, the right network security will aim to prevent you from encountering a cyber attack in the first place. Trust controls give you visibility of every device on your network. So, digital teams can protect all staff and students by patching, updating, and configuring remotely.

As a result, you'll know if a researcher in the biology department moves a device between labs and plugs it in elsewhere. And you'll know when a student connects a personal device to the network in real-time.

This approach to cyber security aims to provide consistent and scalable protection – even for sprawling campus environments that blend online and physical worlds. It's all about keeping student data safe, avoiding fines, and protecting the reputation you've worked hard to build.

68%

Wider competition

The number of EU students starting full-time undergraduate courses drastically fell by 68% between 2020 and 2024, as Brexit introduced higher fees and revoked eligibility for fee loans. It means UK universities face stiffer competition from international universities as well as greater pressure to justify their fees by providing better student experiences.*

*The House of Commons Library

84.5%

Learning support

The majority (84.5%) of higher education students under the age of 21 believe IT resources and facilities have supported their learning well. However, this figure drops to 83.9% among students aged 21 to 25, which is below the national benchmark. Student satisfaction among 26 to 30-year-olds is also below the benchmark.*

*National Student Survey 2024

81.9%

Advanced academia

The majority (81.9%) of medicine and dentistry students under 21 years old can easily find subject specific resources such as software. However, those aged 21 and above in the department rank below the benchmark in terms of satisfaction – suggesting that software access is a bigger challenge for more advanced or mature students.*

*National Student Survey 2024

96%

A prime target

Most higher education institutions in the UK identified a breach or cyber attack in 2023. Of these organisations, six-in-10 had been negatively affected by a breach, indicating a need for greater cyber security across the higher education sector nationwide.*

*www.gov.uk

Decreasing network outages linked to essential operations

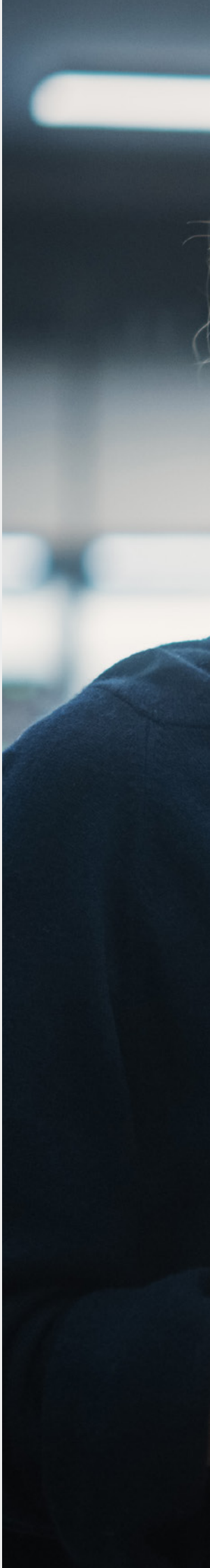
Keep your university running without encountering network outages to services, especially those critical to students achieving their degrees. You'll be able to minimise the probability of an outage resulting from hardware faults, as well as quickly identify any outages that do occur.

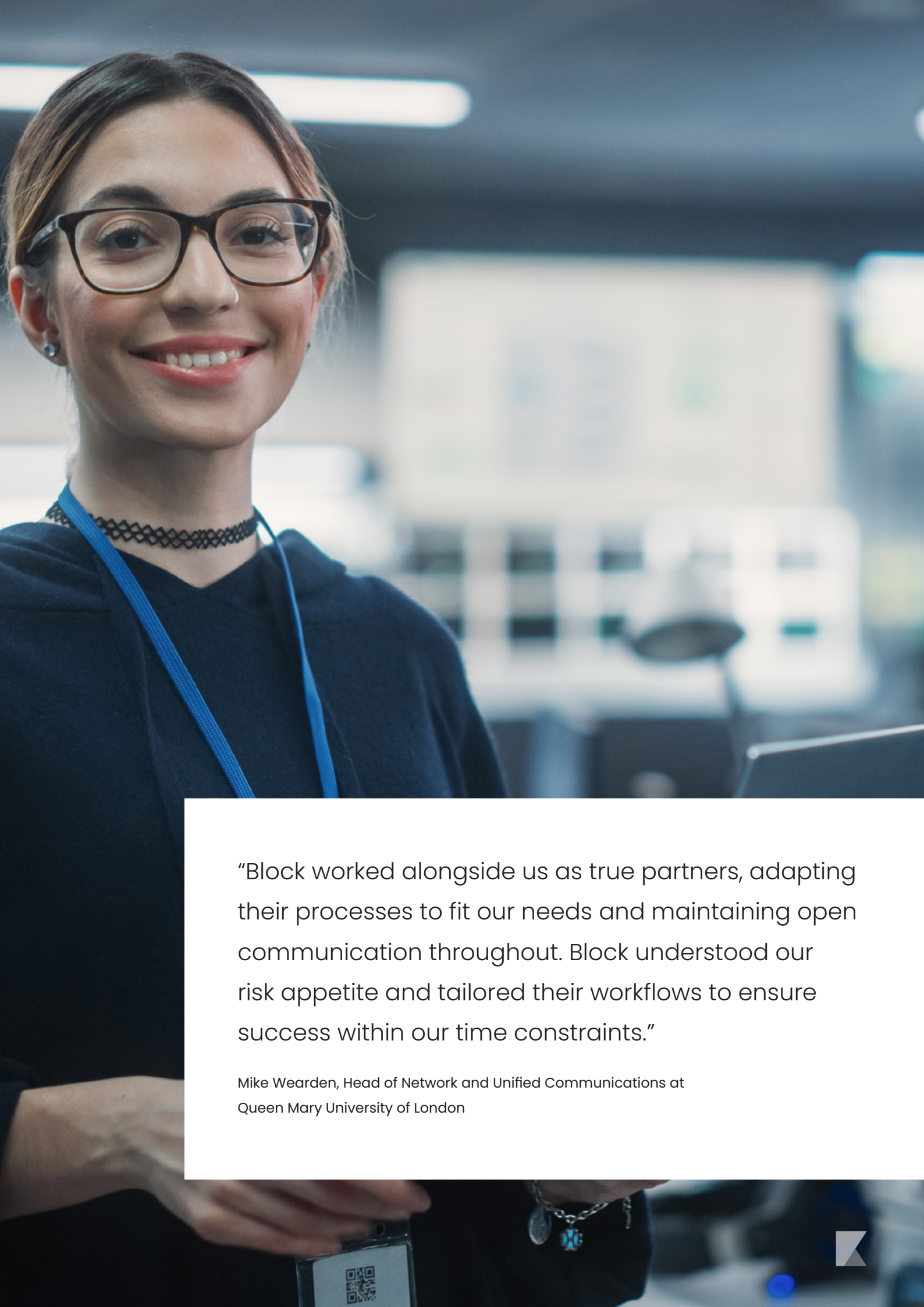
Layering coverage from multiple access points across key areas of your campus mitigates any connectivity failures resulting from broken hardware. This means if a student is using an iPad in an area of campus where an access point suddenly breaks, they won't lose connectivity because they'll still be in range of an access point with overlapping coverage.

Software-based outages should also be a key consideration in how you structure your network. It's common for digital teams in education to hold off software upgrades until the summer holidays because term time and exam season are too pressing to allow for downtime. However, these upgrades create technical debt, which tends to snowball over time. Better visibility via cloud-based applications can help you detect software issues and fix them as soon as they appear. Fixing these problems quickly and early-on can strengthen your university's business continuity with minimal disturbance to teaching.

Choosing the right network delivery partner is also essential here. For example, Block's experience resides in high-stake and high-reputation environments, such as Russell Group universities. As a result, our experts implement upgrades during the least disruptive operation periods – regardless of what time of the day or night that might be. For instance, Block implemented the majority of Queen Mary University of London's network refresh during the eight week window of the summer holidays.

Ultimately, the goal should always be to bring the benefits of good connectivity, without compromising world-class research or education in the process.





"Block worked alongside us as true partners, adapting their processes to fit our needs and maintaining open communication throughout. Block understood our risk appetite and tailored their workflows to ensure success within our time constraints."

Mike Wearden, Head of Network and Unified Communications at Queen Mary University of London

Adding future technologies without stress

Implement any new technologies, without wading through integration complexities. A modern network architecture lays the groundwork for picking up future innovations in UK academia and edtech by using automation. This enables your digital teams to eliminate time-consuming parts of the configuration process.

For example, CCTV cameras currently need to be manually configured to ports and logged on to every switch. However, a software-defined network means you're working with a policy-driven set-up. So, you'll be able to plug a CCTV camera into any port and the network will automatically detect and configure it securely.

This automated process is a huge time-saver for digital teams, especially if you're installing hundreds of cameras during a system refresh.

The same plug and play principle can be applied to lab equipment, business admin tools, and future tech that's yet to be invented.

Ultimately, a flexible, modern network architecture keeps your university on the front foot. You'll be able to quickly adapt to the next wave of digital transformation, regardless of what that looks like.

Improving student safety around campus

Extend high-speed connectivity beyond your university buildings to create a seamless and safe student experience across campus.

For students, being connected outdoors helps with wayfinding apps, which are crucial to navigating tricky campus layouts. The knock-on effect here is that students are more likely to find their way to seminars and lectures on time.

Meanwhile, outdoor connectivity can support the optimisation of your estate infrastructure, such as smart car parking systems and campus surveillance. For example, smart cameras and motion sensors rely on strong network access to work effectively.

This outdoor network connectivity is also important in keeping students safe, especially for those walking alone at night. Many university libraries and study spaces are open 24/7. Feeling connected can reassure students when walking around campus at night because they can use real-time location sharing and emergency check-in apps to stay in touch with loved ones.

In addition, universities can send instant campus-wide emergency alerts using SMS or push notifications to keep everyone informed. There's also the possibility to analyse Wi-Fi connectivity patterns to identify individual students who may be at risk or need support.

For example, The University of Reading uses Juniper Mist AI to enhance its Wi-Fi connectivity as well as collect insights on student behaviour.

Analytics can show how a student normally interacts with campus spaces by using network engagement levels. If a student suddenly stops appearing in academic buildings or common areas, the pastoral team can check in with the them and make sure they're ok.

Supporting remote working and better inclusivity

Save costs and create a more inclusive experience by making education accessible beyond campus.

Professors can teach remote students without compromising the quality of learning, thanks to high-speed connectivity powering collaboration tools. This opens up multiple benefits. For example, universities can recruit professors from anywhere in the world, opening up the talent pool to industry experts, no matter their location.

International students can also enrol without needing to relocate to the UK, helping address the recent drop in overseas students. Plus, online access to lectures improves accessibility for students with physical disabilities or learning difficulties by letting them study at their own pace and in their own environment.

Admin teams working remotely can also take advantage of an enhanced network experience. A modern wireless network enables trust controls, allowing digital teams to manage system access for off-campus devices without increasing security risks.

This means admin staff and remote professors can work securely in processing and updating student data without jeopardising system integrity.

Combining this strong security with federated identity and roaming policies can unlock seamless remote working and interoperability across your university campuses worldwide. Staff at international campuses can access the same network, providing a consistent experience across your university brand.

In addition, students can start their degree at your UK campus, before spending a gap year at your international campus – all while using the same account and academic systems without disruption. Their data travels with them securely and is instantly accessible to verified staff across all campuses.

This means student records like ID, fee status, academic transcripts, or support needs don't need to be shared repeatedly. It saves time for students and staff as well as removes the frustration of having to repeat the same details.

Providing clinical-grade connectivity to medical schools

Get medical students ready for real-world hospital environments by providing the same clinical-grade connectivity as the UK healthcare sector.

Digital transformation is at the heart of the government's healthcare strategy. NHS Trusts are already upgrading to advanced network infrastructure and adopting smart hospital technologies to improve care.

These same innovations are now available to UK medical schools, allowing students to train with the tools they'll use in their careers - both now and in the future.

For example, specialised video conferencing tools allow students to practice virtual consultations – an increasingly common reality for today's patients.

High-bandwidth networks also support sharing large files like MRIs and X-rays in real-time - a critical capability for hospitals that now review patient scans digitally during multi-disciplinary (MDT) meetings.

Beyond communication, a reliable network opens the door to IoT connected mannequins and clinical equipment in training environments. This doesn't just offer a more realistic learning experience, it also enables data tracking on student performance during simulated procedures, with automatic feedback to help them improve.

FutureNow Networks

Block partners with UK universities to design, build, and optimise network architecture for competitive learning experiences. Our mission is to ensure resilient, FutureNow connectivity that enables seamless collaboration, digital innovation, and joined-up education.

Preparing for the unknown future is just as critical as addressing today's needs. That's why our approach focuses on improving services while maximising the value of existing infrastructure investments - helping digital teams within higher education scale without unnecessary complexity.

A network built for resilience

- **Zero downtime philosophy:** We build networks with failover capabilities and automated recovery to minimise outages.
- **Full stack visibility:** Automated monitoring and proactive issue resolution ensure problems are detected and resolved before they impact teaching.
- **Software-centric network innovation:** We allow for continuous application updates to drive reliability, performance, and security.
- **Infrastructure that adapts to demand:** Agile Infrastructure as Code (IaC), DevOps, and automation enable rapid scaling to support daily learning.

A partner for digital transformation

At Block, we know networking is just one part of your university's digital strategy, with 100-200+ IT projects running at any time. However, your infrastructure must work seamlessly across all critical systems, from learning management systems, and research facilities, to cyber security, and halls of residence access points.

At a base level, this means creating guaranteed experiences, whether that's on wired or Wi-Fi, on-site or remote, with protection against new and emerging threats.

We're working with universities who want to view the network as a single cohesive entity – rather than components. This means shifting towards a single sourcing model for wired, Wi-Fi, WAN, and internet services – using technologies such as SD-WAN to bring domains together.

Over the past two decades, Block has established reliable ways of getting customers from A to B, in clinically complex environments without downtime.

This includes using tools that allow us to automate migration to new networks and reduce disruption, as well as our methodology for provided warranted Wi-Fi.We're driven by a belief in better, determined to deliver faster, and committed to making smarter, more resilient technology work for you because patient care depends on it.

When we apply the Block approach to your organisation, lasting transformation isn't just possible - it's protected.

Let's talk about your network transformation.
Contact us at: marketing@block.co.uk

Jisc

BLOCK